

**REMARKS**

The present application has been amended in response to the Examiner's Office Action to place the application in condition for allowance. Applicant, by the amendments presented above, has made a concerted effort to present claims which clearly define over the prior art of record, and thus to place this case in condition for allowance.

In the Office Action, the Examiner rejected the claims under 35 U.S.C. §103(a), citing U.S. Patent Application Publication No. US 2004/0018748 (Lu et al.), U.S. Patent No. 6,124,198 (Moslehi) and U.S. Patent Application Publication No. US 2004/0002211 (Young).

Claims 1, 3, 6 and 8 are independent. Claim 1 specifically claims a method of forming an interconnect including, among other steps, depositing an interconnect liner layer of aluminum-copper alloy in a trench and via, depositing copper onto the aluminum-copper alloy interconnect liner layer, and polishing the copper. Claim 3 specifically claims a method of forming an interconnect including, among other steps, depositing an intermediate liner layer in a trench and via and on a copper deposit, depositing an interconnect liner layer of aluminum-copper alloy on the intermediate layer, depositing copper onto the aluminum-copper alloy, and polishing the copper. Claim 6 specifically claims an interconnect which includes, among other things, a first copper deposit, a second copper deposit, and an aluminum-copper alloy interconnect liner disposed between and in contact with the first and second copper deposits and between the second copper deposit and at least one of the dielectric layers. Claim 8 specifically claims an interconnect which includes, among other things, an intermediate interconnect liner disposed between two copper deposits and in contact with at least one of the copper deposits, and an

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aluminum-copper alloy interconnect liner disposed between the copper deposits, between one of the copper deposits and at least one of the dielectric layers, and in contact with at least one of the copper deposits.

None of the references made of record disclose or suggest what is being claimed. For example, the primary reference relied upon by the Examiner, Lu et al. (US 2004/0018748 A1), discloses lining a trench and via with a barrier/adhesion layer of a refractory nitride (see sections 0027 and 0034), and then filling with metal, such as copper or an aluminum-copper alloy. The reference does not disclose depositing or using an aluminum-copper alloy interconnect liner layer prior to a copper fill. In Lu et al., if an aluminum-copper alloy is used for the fill as suggested by Lu et al., the aluminum-copper alloy contacts a barrier/adhesion layer of a refractory nitride, not copper. On the other hand, if copper is used for the fill as suggested by Lu et al., no aluminum-copper alloy is used at all.

Applicant respectfully submits that the prior art of record neither discloses nor suggests what is being claimed in the present application. Lu et al. deals with the general dual damascene technology in copper based interconnect, Moslchi describes "free space" ILD, and Young deals with different kinds of interconnect alloys. All of these references mention an old Al-based interconnect technology as a prototype for a current Cu-based one, some of these references have discussed some aspects of electromigration induced failure and how the interconnect reliability can be improved based on their disclosures, but none of the references propose the use of aluminum liners in copper dual damascene technology for any purposes, let alone for interconnect reliability improvement, as does the present invention.


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In view of the above amendments and remarks, Applicant respectfully submits that the claims are allowable over the prior art of record, and respectfully requests that the application be passed to issuance.

Should the present claims not be deemed adequate to effectively define the patentable subject matter, the Examiner is respectfully urged to call the undersigned attorney of record to discuss the claims in an effort to reach an agreement toward allowance of the present application.

Respectfully submitted,

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